Fisheries and Oceans Canada | Pêches et Océans Canada
Ecosystems and Oceans Science | Sciences des écosystèmes et des océans

Canadian Science Advisory Secretariat
Gulf Region | Science Response 2016/017

SPAWNER ABUNDANCE AND BIOLOGICAL CHARACTERISTICS OF STRIPED BASS (*MORONE SAXATILIS*) IN THE SOUTHERN GULF OF ST. LAWRENCE IN 2015

Context

The Striped Bass population of the southern Gulf of St. Lawrence has increased in abundance from less than 5,000 spawners in the late 1990s to as many as 255,000 spawners in 2013. Due to conservation concerns, commercial, recreational and aboriginal fisheries for Striped Bass were closed between 1996 and 2000. A small number of food, social, and ceremonial (FSC) fisheries were reinstated in 2012 and allocations of Striped Bass to aboriginal groups have gradually increased since then. With continued requests for additional access to southern Gulf Striped Bass, Fisheries and Oceans Canada (DFO) Gulf Ecosystems and Fisheries Management branch requested an update on the size of the spawning stock and information on biological characteristics to 2015. This Science Response Report results from the Science Response Process of February 19, 2016 on Striped Bass - update estimates of spawner abundance, biological characteristics and fisheries catches and harvests for 2015. The report also provides preliminary results from a Striped Bass diet study that was conducted during 2013 to 2015 in the southern Gulf of St. Lawrence.

Background

Southern Gulf of St. Lawrence Striped Bass (*Morone saxatilis*) are distributed in near shore waters and estuaries from the eastern tip of the Gaspe Peninsula in Quebec to the western tip of Cape Breton Island, Nova Scotia. The only confirmed location where southern Gulf of St. Lawrence Striped Bass spawn every year is the Northwest Miramichi River; consequently, this was the location chosen to develop annual abundance indices. Since 1993, monitoring of bycatch in the commercial gaspereau trapnets of the Miramichi River has been the principal source of information for Striped Bass spawning population numbers for the southern Gulf. The spawner abundance was usually estimated from mark and recapture experiments in which adult Striped Bass were tagged early in May and monitored throughout June as they were captured and released as bycatch in the gaspereau fishery of the Northwest Miramichi Estuary (Bradford and Chaput 1996; Douglas and Chaput 2011). Catch per unit effort (CPUE) from this fishery has been used as an index of abundance for Striped Bass since 1993 (Douglas and Chaput 2011). Selected biological characteristics (e.g., fork length, age, sex, and spawning stage) were recorded from fish captured in commercial gaspereau trapnets (May) and at trapnet monitoring facilities operated by DFO Science (May-October).

DFO Science has been conducting a diet study of Striped Bass with the focus being on the spring pre-spawning and spawning aggregations in the Miramichi River during May and June. Stomachs were collected from Striped Bass captured by angling or in trapnets between 2013 and 2015. Striped Bass stomachs were also collected opportunistically from other time periods and locations in the southern Gulf of St. Lawrence in 2013 to 2015.

A limited recreational fishery for Striped Bass was reopened in 2013 and additional angling opportunities were granted in each of 2014 and 2015 (Appendix 1).

Analysis and Response

Spawner abundance

For the purpose of the 2015 Striped Bass assessment program, one gaspereau trapnet was operated in the Northwest Miramichi River between 12 and 29 May before the opening of the commercial gaspereau season. The regular gaspereau season in the Northwest Miramichi was from 6 pm on 1 June to 6 pm on 29 June. Some traps were first set on 2 June with the first catches to monitor on 4 June. Gaspereau catches were monitored regularly throughout the season with 52 of a possible 144 (36%) trapnet hauls sampled for Striped Bass bycatch.

The sampling period considered appropriate for estimating abundance of Striped Bass spawners occurred between 4 June and 14 June. Similar to previous years, the bycatch of Striped Bass was highest early in the season and decreased to low levels by mid-June (Appendix 2). DFO Science personnel first observed spawning Striped Bass in the Cassilis area (Northwest Miramichi) on 27 May which coincided with increasing water temperatures above 15°C.

The Bayesian hierarchical model used in previous Striped Bass assessments was applied to the 2015 CPUE information from the gaspereau fishery (Chaput and Douglas 2011). Similar to 2014, an adjustment to the model was made to account for the observed behaviour of Striped Bass carrying internal acoustic tags (DFO 2015). The movements of 84 Striped Bass carrying acoustic transmitters were monitored with receiver arrays anchored throughout the Miramichi during May and June 2015. The tracking of acoustically tagged Striped Bass provided information on the daily distribution of spawners on the spawning grounds and therefore available to be captured in the gaspereau trapnets of the Northwest Miramichi.

To estimate spawner abundance in 2015, the catch rates on individual sampling dates were assumed to be proportional to the spawner abundance on the spawning grounds in the Northwest Miramichi. The abundance on the spawning grounds for those dates was estimated as the product of the total spawner abundance at the beginning of the spawning period and the proportion of the acoustically tagged bass on the spawning grounds. Based on acoustically tagged bass, the proportions declined from 35% on 4 June to 5% on 14 June. The median of estimated spawner abundance in 2015 was 301,000 with very wide confidence intervals (5^{th} and 95^{th} percentiles of 151,400 and 696,900) (Fig. 1).

Catches of Striped Bass at DFO index trapnets at Millerton on the Southwest Miramichi River and at Cassilis on the Northwest Miramichi River provide fishery-independent indices of the southern Gulf Striped Bass population. In 2015, the trapnet at Cassilis operated between 25 May and 23 October but was lifted for a one week period between 30 September and 6 October due to high water. The trapnet at Millerton began operating on 27 May but ceased operation prematurely on 30 September due to high water and extensive damage to that facility. Catches of Striped Bass at these facilities were the highest of the May/June time series (n = 7,086) and largely the result of a single day's catch in the Cassilis trapnet of nearly 3,000 bass on 28 May. Autumn catches at both facilities were among the lowest of the time series and likely a consequence of the Millerton trapnet not operating in October (Appendix 3).

The Recovery Potential Assessment proposed a recovery limit and target for the southern Gulf Striped Bass population based on the abundance of spawners estimated for the Northwest Miramichi estuary (DFO 2006; Douglas et al. 2006). The proposed recovery limit was at least

21,600 spawners in five of six consecutive years. Once that was achieved, then the proposed recovery target for considering fisheries access was ≥ 31,200 spawners in three of six consecutive years. It was also suggested that the 5th percentile of the spawner abundance estimate be used to assess status relative to these recovery objectives (Douglas et al. 2006). The abundance of Striped Bass spawners in the Northwest Miramichi in 2015 was sufficient to meet the recovery limit and target for the fifth consecutive year (2011-2015) (Fig. 1).

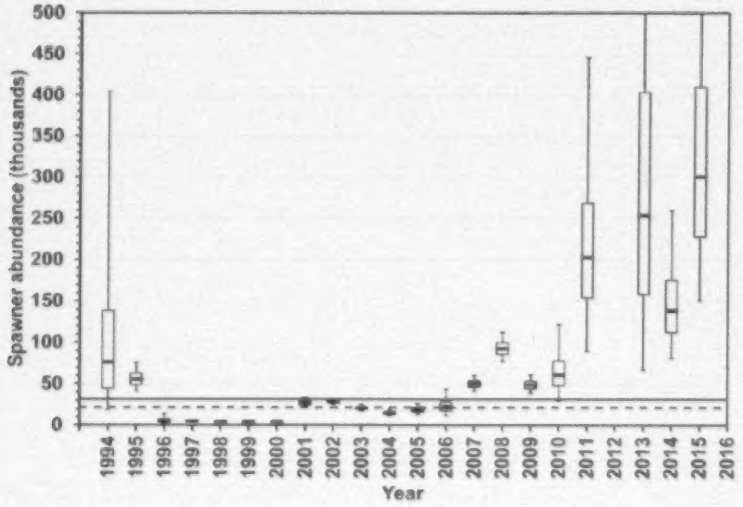


Figure 1. Estimated abundances of adult Striped Bass spawners in the Northwest Miramichi estuary between 1994 and 2015. The estimate for 2010 is considered to be an underestimate due to the earlier timing of the spawning events (Douglas and Chaput 2011). There is no estimate for 2012 because spawning was very early and bass left the sampling area prior to monitoring activities (DFO 2013). Box plots are interpreted as follows: dash is the median, boxes are the interquartile range, and the vertical dashes are the 5th to 95th percentile ranges. The solid and dashed horizontal lines show the recovery objectives defined in the Recovery Potential Assessment (DFO 2006).

Biological characteristics

The mean fork length (FL) of adult Striped Bass (assumed to be fish > 30 cm) measured in May 2015 was 42.4 cm (range 30.0 to 89.3 cm; n = 4,915).The small average size in 2015 was due to the large abundance (61% of total sample) of bass measuring between 30 and 40 cm which was similar to the pre-winter lengths of bass sampled in the autumn of 2014 (Fig. 2). This dominant mode of small fish is likely recruitment from the 2012 yearclass.

During the spring, 25% of Striped Bass measured between 46 and 61 cm FL, the equivalent of the 50 to 65 cm total length (TL) slot regulation.

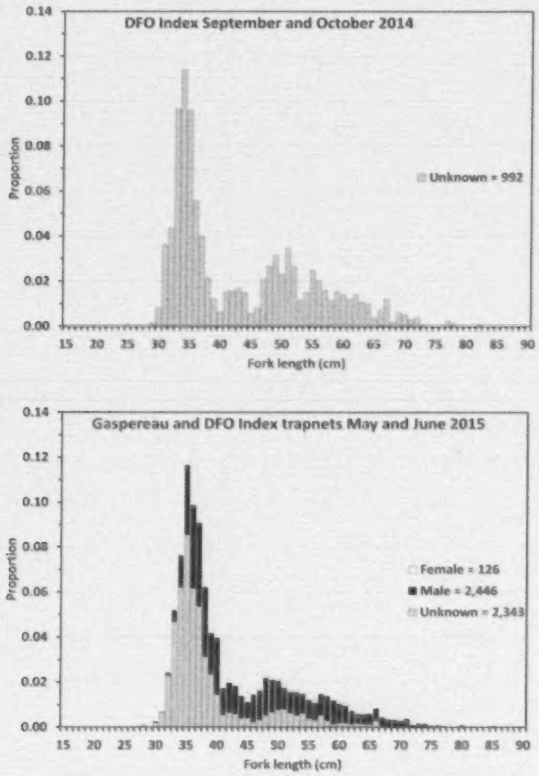


Figure 2. Fork length distributions of Striped Bass by sex and season. The upper panel summarizes the frequency by fork length of Striped Bass sampled at DFO index trapnets in September and October 2014 and the lower panel summarizes the frequency by fork length of Striped Bass sampled in the gaspereau trapnet in the Northwest Miramichi and in DFO index trapnets in May and June 2015.

Striped Bass Diet in May and June in the Miramichi Estuary

Annually, Striped Bass return from coastal feeding migrations in the fall to overwinter in estuaries, including the Miramichi, where they typically remain until ice-out. They spawn sometime between late-May and mid-June, depending on the water temperature. Striped Bass do not feed during the winter months but resume feeding in the spring when the ice leaves and water temperatures begin to increase. Once spawning is complete, Striped Bass return to the coastal environment of the southern Gulf of St. Lawrence for the summer and fall during which time the majority of their feeding and growth occurs.

Over 1,800 Striped Bass stomachs, approximately 600 in each year between 2013 and 2015, were collected in the Miramichi estuary during May and June and stomach contents quantified (Appendix 4). Striped Bass were collected by angling (47% of samples) or from trapnets (53% of samples) and had a mean fork length of 47.7 cm (range 19.2 to 86.2 cm).

Over the three years, 14 species of fish, five groups of crustaceans, seven groups of insects, and one group of marine worms were identified from Striped Bass stomachs collected in the spring. For summary purposes, prey were either reported to species level or included in one of seven broad prey categories.

The diet of Striped Bass sampled in the Miramichi estuary during May and June were notably consistent between years (Fig. 3). The majority (mean 68%, range 63%-77%) of Striped Bass stomachs were empty (Fig. 3). Rainbow Smelt was the most common prey species followed by gaspereau. Gaspereau were absent from samples collected by angling which suggests that Striped Bass captured in trapnets may exhibit a different feeding behaviour than the majority of the population that is not confined to fishing gear. Despite their low occurrence in Striped Bass stomachs, gaspereau were the most important species in terms of prey weight (Fig. 3). Over all years and capture methods, the remaining prey species or prey categories (including Atlantic Salmon smolts) were present in ≤ 2% of Striped Bass stomachs and contributed on average ≤ 3% of the prey biomass during May and June in the Miramichi estuary (Fig. 3).

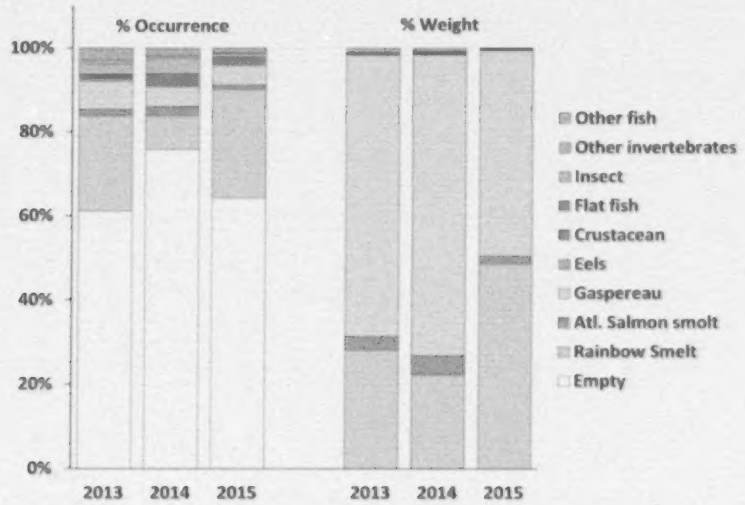


Figure 3. Summary of the percent occurrence of prey species or prey categories (left) and their corresponding percent weight (right) in the stomachs of Striped bass collected from the Miramichi River in May and June 2013-2015.

Rainbow Smelt undergo spawning and post-spawning migrations through the Miramichi estuary in April and May and are the first prey species available in large quantities when Striped Bass resume feeding in the spring. In each year of the diet study, Rainbow Smelt were the earliest prey species to be found in the stomachs of Striped Bass (Fig. 4).

A total of 48 Atlantic Salmon smolts were identified in 28 Striped Bass stomachs sampled during the 3-year spring diet study and many of these could only be identified based on otoliths (Appendix 5). The majority of smolts were collected from angled Striped Bass over a one (2015) or two week (2013, 2014) period in late May (Fig. 4). The short duration of smolt predation by Striped Bass is consistent with the typical 1-2 week period when the smolt migration is at its highest (Chaput et al. 2002). The migration to the ocean by Atlantic Salmon smolts typically occurs during the time when post-spawned Rainbow Smelt are returning to the ocean. The consumption of Atlantic Salmon smolts by Striped Bass generally occurred as the last Rainbow Smelt were found in stomach samples (Fig. 4).

Gaspereau were only identified in the stomach contents of Striped Bass collected in June which is consistent with the timing of the peak spawning migration of gaspereau to the Miramichi

River, which generally occurs after the emigration of Rainbow Smelt and Atlantic Salmon smolts (Fig. 4).

Empty Striped Bass stomachs were common throughout the spring period in all three years of the study (Fig. 4). High proportions of empty stomachs occurred in late May and early June, when Striped Bass spawning is usually at its peak and the abundance of Rainbow Smelt and gaspereau is low. This suggests that the majority of Striped Bass feeding in the Miramichi estuary during the spring occurs before and after the peak spawning time for Striped Bass.

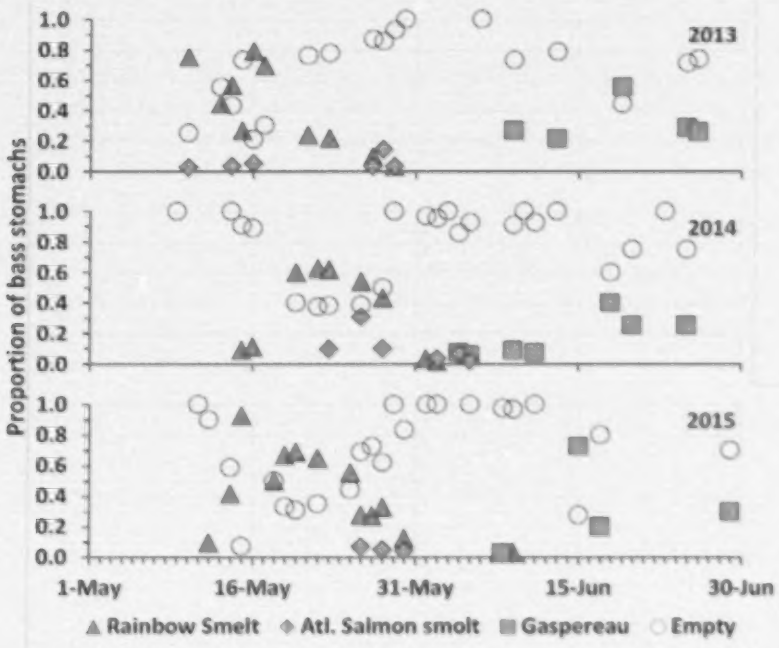


Figure 4. The proportion of Striped Bass stomachs by date that were empty or contained Rainbow Smelt, Atlantic Salmon smolt, and/or gaspereau in the May and June period from the Miramichi River in 2013 to 2015. Only dates for which ≥3 stomach samples were collected are shown. Proportions may not add to one because not all prey groups are shown.

Striped Bass Diet in the Southern Gulf of St. Lawrence

An additional 467 Striped Bass stomach samples were collected opportunistically in 2013 to 2015 across the southern Gulf of St. Lawrence south of Chaleur Bay to Cape Breton (Appendix 4). These samples were largely collected by angling (75%) but some came from DFO index trapnets in the Miramichi River or gaspereau traps in the Margaree (NS) River. Striped Bass were captured in a variety of habitats from a freshwater riverine location to saline coastal locations. Stomach samples were collected between June and October from Striped Bass with an average fork length of 38.4 cm (range 21.3 – 73.1 cm). For summary purposes, prey were either reported to species level or included in one of nine broad prey categories (Table 1).

The diet of Striped Bass in the southern Gulf of St. Lawrence is diverse and consistent with the species that occupy estuarine and near shore coastal habitats. Eighteen species of fish, eight crustacean groups, three insect groups, marine worms, and a gastropod were identified in the stomach contents of Striped Bass.

In 2013 and 2014, the majority of Striped Bass stomachs were empty but the small number of samples (n = 72 and 85, respectively) collected from a limited number of locations, mostly in the fall, must be considered when interpreting these data (Appendix 4). The majority of stomachs collected in 2014 and 2015 were from Striped Bass in saline coastal waters where the typical near shore species of shrimp (particularly *Crangon septemspinosa*), Atlantic silversides, and species of sticklebacks were the most common prey items (Table 1). The remaining identified prey were present in ≤ 4% (on average) of Striped Bass stomachs (Table 1). One Atlantic Salmon parr was recovered from the stomach of one Striped Bass captured in the Margaree River during spring 2014.

Table 1. Diet, as % occurrence of prey species or prey categories, of Striped Bass (21 to 73 cm fork length) collected from various locations throughout the southern Gulf of St. Lawrence other than those collected during the May/June period in the Miramichi estuary in 2013-2015 (Appendix 4). % occurrence has been rounded to the nearest percentage and the total may be greater than 100% due to bass containing more than one type of prey. A dash indicates the prey item was not found in samples from that year.

	% Occurrence			
Prey	2013	2014	2015	Combined
Shrimp spp.	1	38	39	32
Crustacean	1	-	1	1
Insect	1	1	2	1
Gastropod	-	-	1	0
Other invertebrates	-	3	6	4
Atlantic Silverside	-	1	12	8
Sticklebacks	-	13	9	8
Mummichog	-	1	5	3
Brook Trout	-	-	5	3
Flatfish	2	-	4	3
Eels (lamprey and American)	1	-	4	3
Rainbow Smelt	-	-	3	2
Atlantic Tomcod	1	6	0	1
American Sand Lance	-	4	1	1
White Hake	1	6	-	1
Atlantic Salmon parr	-	1	-	0
Other fish	-	3	1	1
Unidentifiable fish remains	5	3	7	6
Number of stomachs (n)	85	72	310	467
% Empty	86	53	35	47

Conclusions

The monitoring of the movements of Striped Bass onto and away from the spawning grounds using acoustic telemetry provided a method of estimating the proportion of spawners that were available to capture in the bycatch monitoring program of the gaspereau fishery. Spawner abundance in 2015 was estimated at 301,000 fish but with very large uncertainty (95% C.I. 151,400 to 696,900). The estimate in 2015 is within the range of the previously high value of 255,000 spawners in 2013, with similarly very high uncertainty (95% C.I. 67,000 to 864,000). The most abundant size group of Striped Bass in the spring of 2015 measured between 30 and 40 cm FL, representing 61% of bass sampled, and indicates the recruitment of a strong 2012

yearclass. Twenty-five percent of Striped Bass in May and June were estimated to have been within the recreational fishery retention size slot of 50 to 65 cm TL. The recovery objective for southern Gulf Striped Bass was met for the fifth consecutive time in 2015.

The diet of Striped Bass in the Miramichi estuary during May and June was consistent between 2013 and 2015. Most Striped Bass stomachs were empty. Rainbow Smelt and gaspereau were the most frequently occurring prey in the samples. Striped Bass in the Miramichi River during the spring fed opportunistically and changed prey species as they became available (or unavailable) during different migration times. Rainbow Smelt were present when Striped Bass began feeding in the spring and were the first to be consumed, while gaspereau were the last to arrive in the estuary and also the last to be consumed. Small numbers of Atlantic Salmon smolts and in a low proportion of stomachs sampled were observed in late May, and corresponded to the migration period for smolts. The diet of Striped Bass in the southern Gulf of St. Lawrence outside the spring period was diverse and consisted of a variety of fish, crustacean, and insect species that occupy estuarine and near shore coastal habitats.

Contributors

Name	Affiliation
Bélanger, Pierre	DFO Ecosystems and Fisheries Management, Gulf Region
Biron, Michel	DFO Science Gulf Region
Breau, Cindy	DFO Science Gulf Region
Bujold, Valérie	Province of Quebec, Ministère des forêts, de la faune et des parcs
Chaput, Gérald	DFO Science Gulf Region
Doucette, Renelle	DFO Science Gulf Region
Douglas, Scott	DFO Science Gulf Region
Fairchild, Wayne	DFO Science Gulf Region
Hayward, John	DFO Science Gulf Region
Hanson, Mark	DFO Science Gulf Region
Sheasgreen, Joe	DFO Science Gulf Region
Underhill, Kari	DFO Science Gulf Region

Approved by

Doug Bliss
Science Director
Gulf Region

March 16, 2016

Sources of information

This Science Response Report results from the Science Response Process of 19 February 2016 on the Striped Bass - update estimates of spawner abundance, biological characteristics and fisheries catches and harvests for 2015. No additional publications from this process will be produced.

Bradford, R.G. and Chaput, G. 1996. The status of striped bass (*Morone saxatilis*) in the southern Gulf of St. Lawrence. DFO Atl. Fish. Res. Doc. 96/62: 36 p.

Chaput, G. and Douglas, S. 2011. Hierarchical Bayesian model to estimate the spawning stock of Striped Bass (*Morone saxatilis*) in the Northwest Miramichi River, 1994 to 2010. DFO Can. Sci. Advis. Sec. Res. Doc. 2011/081. iv + 51 p.

Chaput, G., Hardie, P., Hayward, J., Moore, D., Sheasgreen, J., and NSPA. 2002. Migrations and biological characteristics of Atlantic salmon (*Salmo Salar*) smolts from the Northwest Miramichi River, 1998 to 2000. Can. Tech. Rep. Fish. Aquat. Sci. No. 2415. 70p.

DFO. 2006. Recovery assessment report for the St. Lawrence estuary, southern Gulf of St. Lawrence and Bay of Fundy striped bass (*Morone saxatilis*) populations. DFO Can. Sci. Advis. Sec. Sci. Advis. Rep. 2006/053. 21 p.

DFO. 2013. Update to 2012 on spawner abundance and biological characteristics for striped bass (*Morone saxatilis*) in the southern Gulf of St. Lawrence. DFO Can. Sci. Advis. Sec. Sci. Resp. 2013/10. 18 p.

DFO. 2015. Recreational fishery catches, spawner abundance, and biological characteristics of Striped Bass (*Morone saxatilis*) in the southern Gulf of St. Lawrence in 2014. DFO Can. Sci. Advis. Sec. Sci. Resp. 2015/011.

Douglas, S.G. and Chaput, G. 2011. Assessment and status of Striped Bass (*Morone saxatilis*) in the Southern Gulf of St. Lawrence, 2006 to 2010. DFO Can. Sci. Advis. Sec. Res. Doc. 2011/097. iv + 22 p.

Douglas, S.G., Chaput, G., and Caissie, D. 2006. Assessment of status and recovery potential for striped bass (*Morone saxatilis*) in the southern Gulf of St. Lawrence. DFO Can. Sci. Advis. Sec. Res. Doc. 2006/041. viii + 95 p.

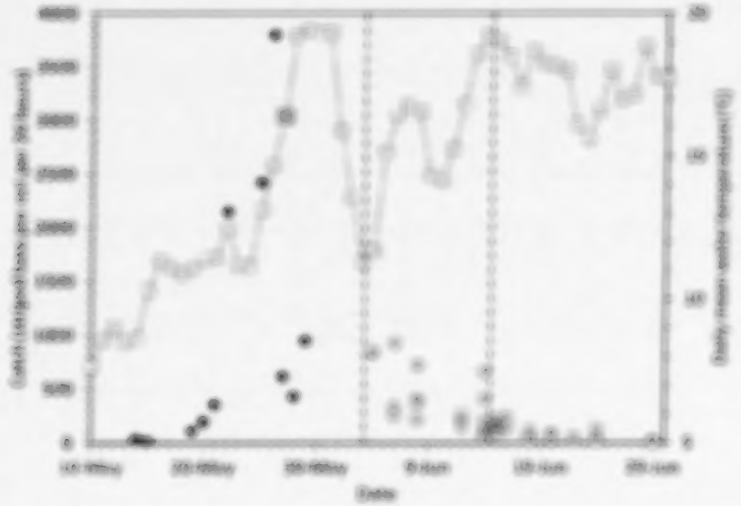
Appendices

Appendix 1. Summary of Striped Bass recreational fishery management measures for 2013 to 2015. SGSL = southern Gulf of St. Lawrence, CB PQ = Chaleur Bay Quebec side, TL = total length.

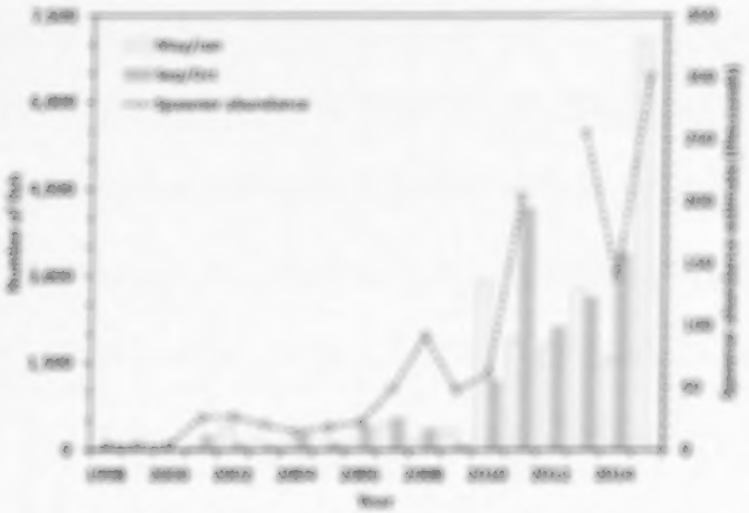
Location	Year	Directed fishing season	Retention period	Limit		Retention size limit (TL)
				Daily retention	Possession	
SGSL	2013	May 1 – Sep 30	May 1 – May 10 Aug 2 - Aug 11	1	1	55 – 65 cm
	2014	May 1 – Sep 30	May 1 – May 21* Aug 1 - Aug 21 Sep 24 - Sep 30	1*	1*	50 – 65 cm
	2015	May 1 - Oct 31	May 11 - May 31 Aug 1 - Aug 23 Sep 4 - Sep 7 Oct 24 - Oct 31	1	1	50 – 65 cm
CB PQ	2013	Jun 15 – Sept 30	None	0	0	None
	2014	Jun 15 – Sep 30	Jul 26 – Aug 24	1	1	< 65 cm
	2015	Jun 15 – Sep 30	Jul 1 – Aug 25	1	1	50 – 65 cm

*Due to cold weather and poor angler success, the retention period in May 2014 was extended for four days to May 25. During this extension, anglers were permitted to retain two Striped Bass per day and possess no more than two at any given time.

Appendix 2. The number of Striped Bass captured per net per day in a single trapnet used before the opening (black circles) and during (grey circles) the commercial gaspereau fishery of the Northwest Miramichi estuary in 2013. Vertical hatch lines encompass the data and the period which were used in the CPUE analyses. Squares show the mean daily water temperature and the larger red square represents the temperature on May 27, the date of the initial observation of Striped Bass spawning in the upper Northwest Miramichi estuary in 2013.



Appendix 3. The combined number of Striped Bass captured in the DFO index trapnets at Cassilis on the Northwest Miramichi River and at Millerton on the Southwest Miramichi River during the spring (May/June) and autumn (Sept./Oct.) from 1998 to 2013. In 2013, the fall index is not shown because it was compromised by damage to the index trapnets in October. The median estimates of spawner abundance are also shown for comparison.



Appendix 4. The number of Striped Bass stomachs collected in 2013-2018. Samples are summarized by season (spring = May and June in Miramichi only, other = all samples other than those collected in the Miramichi during spring), capture location, capture date range, and capture method (angling or trapnet). GNS = Gulf Nova Scotia, NNB = northern New Brunswick, and SENB = southeastern New Brunswick. Striper cup refers to stomach samples extracted from incidental mortalities from the ice release only Striped Bass fishing derby in the Miramichi 30 and 31 May 2018.

				Capture date range		Capture method	
Year	Season	Region	Location	Min	Max	Angling	Trapnet
2013	spring	Miramichi	Northwest	5-May	26-Jun	112	101
			Southwest	25-Jun	26-Jun	3	39
			Main Miramichi	1-May	17-May	77	3
	other	Miramichi	Northwest	24-Sep	30-Sep	3	5
			Southwest	23-Sep	10-Oct	3	79
Total 2013						200	406
2014	spring	Miramichi	Northwest	5-May	26-Jun	178	208
			Southwest	12-May	20-Jun	34	35
			Main Miramichi	22-May	29-May	78	3
	other	GNS	Margaree	8-Jun	8-Jun	3	23
		Miramichi	Main Miramichi	8-Oct	22-Oct	18	3
		NNB	Shippegan	8-Oct	8-Oct	1	3
			Burnt Church	7-Oct	16-Oct	3	3
			Inkerman	16-Oct	16-Oct	3	3
		SENB	Cocagne	10-Jul	11-Jul	11	3
			Cole Ste-Anne	28-Sep	28-Sep	13	3
Total 2014						334	348
2015	spring	Miramichi	Northwest	15-May	26-Jun	192	208
			Southwest	12-May	2-Jun	9	15
			Main Miramichi	22-May	22-May	160	3
			Striper cup	30-May	31-May	28	3
	other	GNS	Margaree	8-Jun	20-Oct	97	8
			Antigonish	22-Jun	22-Jun	4	3
			Pictou	23-Jun	30-Jul	34	3
			Grand Etang	24-Aug	24-Aug	8	3
		Miramichi	Main Miramichi	5-Aug	14-Sep	10	3
		NNB	Burnt Church	16-Jun	7-Oct	28	3
			Tracadie	14-Aug	14-Aug	1	3
			Inkerman	4-Oct	14-Oct	8	3
		SENB	Little Shediouche	25-Jul	27-Sep	70	3
			Shediouche	27-Sep	11-Oct	23	3
			Cocagne	28-Sep	13-Oct	28	3
			St. Edouard	10-Oct	20-Oct	7	3
Total 2015						609	320
Total all years						1,208	1,103

Appendix 2. The number of Atlantic salmon smolts identified in Striped Bass stomach samples collected from the Miramichi River in May and June, 2010 (2010) and 2012. The collection date, total number of stomach samples analyzed, number of stomach samples with salmon smolts and total number of smolts identified from that sampling period are shown. The location indicates the stomach samples containing salmon smolts were collected. "NW / comm gasp" refers to samples from a commercial gaspereau ringnet in the Northwest Miramichi River. "Striper Cup" refers to stomach samples extracted from incidental mortalities during the live release only Striped Bass fishing derby in the Miramichi on 30 and 31 May 2010. All other dates and locations are detailed in Appendix 3.

Year	Date	Total bass in sample	Bass with smolts	Number of smolts in bass	Location
2010	30 May	39	1	1	Upstr/Millerstown
	29 May	51	1	1	Boiestown / Island
	30 May	29	1	1	Boiestown / Island
	27 May	10	1	3	NW / comm gasp
	28 May	30	4	13	Millerstown
	29 May	30	1	1	NW / comm gasp
	All other dates	833	0	0	All other locations
Total 2010		1,000	9	20	All locations
2009	29 May	73	2	2	Boiestown / Island
	28 May	119	9	9	Upstr/Fish Bowl
	28 May	30	3	3	Strawberry Island
	3 Jun	99	3	3	Upstr/Fly
	4 Jun	126	1	1	Upstr/Fly
	5 Jun	93	1	1	Upstr/Fly
	All other dates	950	0	0	All other locations
Total 2009		1,500	19	19	All locations
2008	28 May	30	2	3	Millerstown/NW / comm gasp
	29 May	90	1	1	Millerstown/NW / comm gasp
	30 May	30	1	2	Striper Cup
	All other dates	2,07	0	0	All other locations
Total 2010		2,00	4	10	All locations
Total 2010 to 2010		1,000	28	49	All locations

This Report is Available from the

Center for Science Advice (CSA)
Gulf Region
Fisheries and Oceans Canada
P.O. Box 5030, Moncton, NB E1C 9B6

Telephone: 506 851-6253
E-Mail: csas-sccs@dfo-mpo.gc.ca
Internet address: www.dfo-mpo.gc.ca/csas-sccs/

ISSN 1919-3769
© Her Majesty the Queen in Right of Canada, 2016

Correct Citation for this Publication:

DFO. 2016. Spawner abundance and biological characteristics of Striped Bass (*Morone saxatilis*) in the southern Gulf of St. Lawrence in 2015. DFO Can. Sci. Advis. Sec. Sci. Resp. 2016/017.

Aussi disponible en français :

MPO. 2016. Abondance de reproducteurs et caractéristiques biologiques du bar rayé (Morone saxatilis) du sud du golfe du Saint-Laurent en 2015. Secr. can. de consult. sci. du MPO, Rép. des Sci. 2016/017.